

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

Region III - 8th & Walnut Sts.  
Philadelphia, Pa. 19106

K-FYI

NC  
Steel

**SUBJECT:** Newcastle Steel, Delaware Review of Hydrogeologic  
Report of Phase I Investigations of  
Deemer Steel Casting Company

**DATE:** OCT 3 1984

**FROM:** Paula Luborsky, Hydrogeologist  
CERCLA Remedial Enforcement Section (3HW12)

**TO:** Galina Bendersky, Environmental Engineer  
CERCLA Remedial Enforcement Section (3HW12)

I have reviewed the above mentioned report by Earth Data Incorporated dated June, 1984 and am in agreement with their assessment of the potential for contamination of the ground water of the Upper Potomac Aquifer System. Specifically, downward migration of contaminants from the site and into the Upper Potomac Aquifer would be inhibited by the thick sequence of clays (30-50 feet) that separates the base of the disposal site from the producing zones of the Upper Potomac. Well logs indicate that the moisture content of these clays diminishes with depth and that the clays eventually become dry in two monitoring wells (MW-1 and MW-2). Earth Data Incorporated reports values for hydraulic conductivity (K) between  $6.2 \times 10^{-2}$  and  $2.4 \times 10^{-1}$  gpd/ft<sup>2</sup>.

The shallow ground water system is a water-table aquifer. Based upon water-table contour maps, the direction of the shallow ground-water flow below the site is influenced by the drainage channel bisecting the disposal areas. Earth Data noted seepage in test pits 2,3,5 and 6 at the interface between the sandy fill and silty/clayey sediments. "The relatively higher permeability of the black sand waste in comparison with underlying silty and clayey sediments is likely to favor rapid percolation through the unsaturated zone and rapid lateral flow towards the discharge areas" (Earth Data, 1984, p. 43). Earth Data suggests the channel, the marshes to the southeast and to the south of the site and finally the Delaware River as points of discharge for the shallow ground water. The assessment is a reasonable one. The scenario has not been quantified, though. The statement, "most discharge would be to the adjacent drainage channel at an average rate of approximately 7.0 gpm" (Earth Data, 1984, p. 56) must be verified by gauging the flow of water into and out of the drainage channel over an extended period of time.

Other Comments:

1. Earth Data does not address the velocities of ground-water flow as outlined in the Scope of Work (Section 2.4).
2. Earth Data does not address the attenuation of the possible contaminants by the various strata types through which the ground water moves. Clays, in particular, have a high capacity to adsorb ions and possibly increase the quality of ground water.
3. The stratification of sediments below the site is more complex than suggested by the three cross-sections presented by Earth Data (Figures 5, 6 and 8). Vertical cross-sections taken at a number of transects and making use of all the existing well/boring logs would increase the 3-dimensional picture. Possible cross-sections are MW#2, MW#4, B-16 and MW#3, MW#4, B-16.
4. Earth Data mentions that the effect of tidal variations are likely to be small. It is recommended that this be referenced and documented.
5. Earth Data mentions an apparent upward component of ground water flow. This conclusion is based upon data from two adjacent wells located near a discharge area (the drainage channel) where an upward component is anticipated. The conclusion should not be accepted as a general characteristic of the shallow aquifer below the site without additional monitoring.

*Review of data  
How is the data  
addressing  
contaminants? R*